

Remarks

The Applicants have amended Claim 1 by incorporating the subject matter of Claim 10. Claim 10 has accordingly been cancelled.

The Applicants respectfully submit that the solicited claims are patentable over Davis, Zones and WO '486 inasmuch as all three of those publications fail to teach or suggest the invention as recited in the solicited claims. The Applicants note with appreciation the Examiner's frank acknowledgment that all three of the references do not disclose the claimed crystal size of at most 1 μm . The Official Action takes the position that any crystal size in a catalyst would be expected to result in an effective process since it is the catalyst pore characteristics that determine the effectiveness of the catalyst for a specific application. The Applicants respectfully submit that the pore characteristics and the crystal size are separate physical characteristics and that it would not be proper to assume that any crystal size would be effective because of pore characteristics. In that regard, one of the co-inventors, Mr. Yoshikawa, has already submitted a Declaration confirming that pore characteristics and crystal size are completely different from one another and that not all crystal sizes have an effect.

The Applicants attach a convenience copy of Mr. Yoshikawa's Declaration. That Declaration states that the rapid penetration of a molecule through the pores of the zeolite is important. In this case, the claimed zeolite has a one-dimensional pore system for large aromatic compounds. That pore system is unfavorable for the rapid penetration of a large molecule. The fact that the claimed isomerization process is directed to aromatic compounds having at least three substituents, aromatic compounds having two substituents of which at least one is a halogen or has at least two carbon atoms, and naphthalene or anthracene derivatives having at least one substituent means that the

claimed process is directed to large aromatic compounds. Thus, the Applicants' one-dimensional pore system is unfavorable in that aspect and, accordingly, one of ordinary skill in the art would not expect the catalyst to be particularly effective. Thus, this would lead one of ordinary skill in the art away from the invention. Why would one of ordinary skill in the art look to a zeolite having an unfavorable one-dimensional pore system when trying to isomerize large aromatic compounds when such a one-dimensional pore system is unfavorable for the rapid penetration of a large molecule? The answer is that one of ordinary skill in the art would look away from such a zeolite and use a different system. The Applicants respectfully submit that, for this reason alone, the solicited claims distinguish over the prior art.

Surprisingly, the Applicants discovered that the size of the crystals is what causes the method of the solicited invention to be effective for the claimed aromatic compounds. This is different from the pore characteristics. As a consequence, the crystal size may not be important for zeolites having a three-dimensional pore system and for the reaction of relatively small molecules compared to the pore size of the zeolite. In other words, crystal size is not always important in certain systems in providing effectiveness.

The solicited claims specifically call for the isomerization of large aromatic compounds. Those aromatic compounds are specifically defined in the claims under letters (a), (b) and (c). These are sharply different from small aromatic compounds such as xylene. All of Davis, Zones and WO '486 describe isomerization of xylene. This is not what the Applicants claim because xylene does not fall within the large aromatic compound definition set forth in the solicited claims. Also, the Declaration of Mr. Yoshikawa has demonstrated that one of ordinary skill in the art would not have an expectation of effectiveness with respect to modification of crystal size because zeolites having

a three-dimensional pore system have virtually no importance in conjunction with the use of small molecules relative to those claimed herein. Thus, all of Davis, Zones and WO '486 are inapplicable.

In any event, careful scrutiny of the entire disclosure of Davis, Zones and WO '486 reveals that they are utterly silent with respect to crystal size. The closest discussion in Davis, for example, with respect to crystal size may be found in Column 6, beginning at line 41, wherein the reaction mixture is described with respect to CIT-5 crystals. However, this has nothing to do with the isomerization process. This is merely for the formation of the CIT-5 zeolite. Moreover, there is utterly no disclosure concerning crystal size.

There is another passage in Davis that actually does disclose some type of sizes, albeit not crystal size. This may be found in Column 9, beginning at line 59, wherein Davis discloses that CIT-5 can be formed into a variety of shapes which can have a particle size sufficient to pass through a 2-mesh (Tyler) screen. Unfortunately, this provides no guidance to one of ordinary skill in the art. A 2-mesh (Tyler) screen is not even remotely close to the claimed crystal size. The Applicants attach an excerpt showing various Tyler mesh equivalents. The lowest Tyler mesh is 2.5, which has an 8.0 mm opening. A 2-mesh size would even be larger. The Applicants respectfully submit that an 8.0 mm opening is hardly suggestive of a crystal size of at most 1 μm . Otherwise, there simply is not a single word in the Davis disclosure concerning the crystal size of the zeolite.

Zones is similarly deficient. Zones also has a brief discussion of particle size at Column 8, beginning at line 43. This discussion again mentions the 2-mesh (Tyler) screen size. Zones is accordingly deficient for the same reasons set forth above with respect to Davis.

WO '486, on page 13, once again has the same discussion as Zones and Davis with respect to the 2-mesh (Tyler) screen size of particles. Otherwise, WO '486 is utterly silent on the issue of

crystal size.

Having established the total silence of all three references on the claimed crystal size of at most 1 μm , the Applicants respectfully submit that all three references fail to teach or suggest the invention as recited in the solicited claims. It must be remembered that the references must satisfy two conditions to be effective under §103. There must be teachings or suggestions in the prior art suggesting that a modification be made. Then, there must be a reasonable expectation of success upon making such modifications. The Official Action takes the position that one of ordinary skill in the art would have a reasonable expectation of success that, based on pore characteristics, varying crystal size would prove effective. However, that is not the test. Crystal size and pore characteristics are different.

The test is, therefore, whether there are teachings or suggestions in any of Davis, Zones and WO '486 that suggest that a modification of the crystal size (not the pore size) would be effective. The answer to that question is a resounding "no". There is not a single word in any of Davis, Zones and WO '486 that mentions crystal size at all. It inherently, therefore, follows that there would be no reasonable expectation of success that changing the crystal size would be effective. The Official Action "mixes and matches" pore characteristics and crystal sizes. Varying the pore characteristics and any expectations of success that might be associated with such variations of the pore characteristics is a totally different matter than varying the crystal size which is different.

Therefore, the Applicants respectfully submit that it would be in error to speculate that any expectations associated with changing pore characteristics would automatically or inherently transfer to varying crystal sizes. They are different characteristics and, as established by Mr. Yoshikawa in his earlier Declaration, would not be expected to act in the same way. None of Davis, Zones and

WO '486 can be utilized to provide teachings or suggestions to modify crystal size and there would not be any reasonable expectation of success associated with such modification in view of the fact that not one of those references contains a single word associated with crystal size. It is nothing more than unsupported speculation, nowhere grounded in fact on this record, that one of ordinary skill in the art would have a reasonable expectation of success by modifying crystal sizes when they are not even mentioned at all in the prior art.

The Applicants respectfully submit that all of the claims are now in condition for allowance, which is respectfully requested.

Respectfully submitted,



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